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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,595	10/12/2001	David W. Quint	10007154-1	2761

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT PAPER NUMBER

2827

DATE MAILED: 01/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/977,595

Applicant(s)

QUINT ET AL.

Examiner

Ishwar B Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 12-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 23-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-11 and 23-25, drawn to a semiconductor device assembly, classified in class 29, subclass 260.
 - II. Claims 12-22, drawn to a process of fabricating a semiconductor device assembly, classified in class 29, subclass 832.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions group II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process such as the product can be made without using the spring pin and selecting the CTE of the pin. Further the pins can be attached either by solder or by press fitting in the via holes of the substrate. Further the product does not need the conductivity test.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the

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search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with David M. Mason (42,846) on January 15, 2002, a provisional election was made without traverse to prosecute the invention of a semiconductor device assembly, group I, claims 1-11 and 24-25. Affirmation of this election must be made by applicant in replying to this Office action. Claim 12-22 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

6. The drawings are objected to because figures are improperly cross hatched. All of the parts shown in section, and only those parts, must be cross hatched. The cross hatching patterns should be selected from those shown on page 600-81 of the MPEP based on the material of the parts. See also 37 CFR 1.84(h)(3) and MPEP 608.02.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

7. The disclosure is objected to because of the following informalities:

(a) The sentence "The substrate 24 is or plastic (laminate)" does not seem correct, page 10, line 12-14. Substrate made of FR-4 is not called a ceramic substrate.

(b) "pcb" should be - - PCB - -, page 13, line 7.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 4, 6, 8 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 4, the spring pins provide a flexible compliance, in claim 5, the bent region absorb the thermal variation, in claim 8 and 25, the change in the spring pins reduce the development of electrical opens, however these are all the functional limitation and is unclear whether they are adding any structural limitations. The claim in

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dependent form should contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-2,5, 10, 23, and 24 rejected under 35 U.S.C. 102(b) as being anticipated by Simpson (US Patent 4,764,848).

Regarding claims 1 and 23, Simpson discloses a semiconductor device assembly, comprising:

a semiconductor chip (electronic device 18, see figure 1, column 4, line 30-60);

a plurality of spring pins (pins 22, see figure 1, column 4, line 57-68);

a substrate coupled between the chip and the plurality of spring pins (substrate 16, see figure 1, column 4, line 30-65); and

a PCB coupled to the plurality of spring pins (board 10, see figure 1, column 4, line 30-55).

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Regarding claim 2, Simpson further discloses the pins having a central C-shaped region (see figure 1)

Regarding claim 5 and 24, Simpson further discloses the pins include a bent central region (see figure 1).

Regarding claim 10, Simpson further discloses the substrate fabricated from ceramic, column 4, line 40-45.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (US Patent 4,764,848) as applied to claim 1 above.

Regarding claim 3, the applicant is claiming the pins having a central V-shaped region. Though, Simpson does not explicitly disclose a V-shape region, the pins with various shapes, including V-shape in known in the art. Further the shape of the pins will depend upon various factors, such as the flexibility required, the method of manufacturing the pins, type of material used, the space available in the assembly, etc.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Simpson with spring with a central V-shaped region in order to get the desired flexibility between the substrate and the PCB.

Regarding claim 9, though Simpson does not explicitly disclose pitch of about 30 mils to 100 mils, the smaller pitch for increasing the component density is known in the art. Further, the crux of the invention of Simpson is to provide an assembly with more densely packed circuitry. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Simpson with the spring pin having a pitch of about 30 mils to 100 mils in order to increase the component density.

Regarding claim 11, the applicant is claiming a bond wire attached between said chip and said substrate. Though, Simpson does not disclose any specific method of connecting the chip and the substrate, both the bonding with or without wire are well known in the art depending upon the uses of the assembly, such as, if distance between the pad on the chip and the substrate is to be shortest possible for the functioning of the system, the flip chip bonding without the wire will be better. In the situation where the design of the substrate is such that it is not possible to use flip chip method, using bump, a wire bonding method will be used. Further, both bonding with wire and without wire have there own advantage and disadvantage depending upon the situation. Therefore, it would have been obvious to one having ordinary skill in the art at the time

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the invention was made to provide the assembly of Simpson with wire bond in order to electrically connect the chip with the substrate to have reliable connection in the particular situation.

14. Claims 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (US Patent 4,764,848) as applied to claim 1 above, and further in view of Dozier, II et al. (US Patent 5,772,451, hereafter referred to as Dozier).

In claim 7, the applicant is claiming the PCB couples to the spring pins by a force applied from the assembly. Though, Simpson does not disclose the coupling of PCB and spring pin by force applied from the assembly, the coupling with the force from the assembly is known in the art. Further, what type of coupling between PCB and pins are required will depend upon various factors, such as the ease with which the assembly can be dismantled for repair, the reliability of the connection, etc. Further, Dozier discloses the connection of pin by using spring clip (see Dozier figure 3, spring clip 340). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Simpson with PCB and pins connected by a force from the assembly in order to get the connection which facilitate easy dismantling during repair / replacement. Further, the determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior

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product was made by different process. In re Thorpe, 777 F.2d 695, 698, 227 US 964, 966 (Fed. Cir. 1985).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gates, Werther, Pfaff, Khandros et al., discloses the assembly similar to applicant's claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar B Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave L Talbott can be reached on (703) 308 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
January 22, 2002

K. K. K.
K. K. K.
Primary Examiner